

## Abstract

In a multi-carrier communication apparatus, it is an object of the invention to increase the amount of data per unit time greatly with the band width kept unchanged. A modulator (102) sequentially performs primary modulation of data (101) which are first transmitted data on the basis of, for example, QPSK modulation. A pattern generating unit (104) generates a pattern of particular signals which is to be allocated to sub-carriers of a matrix formed by arranging a plurality of sub-carriers arranged in the direction of a frequency axis into a plurality of symbols in the direction of a time axis. The pattern is determined based on data (103) which are second transmitted data. A mapping unit (105) allocates the sub-carriers modulated by the data (101) at the modulator (102) and the pattern of the particular signals to the sub-carriers of the matrix.